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September 12, 1959

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PAGES 161-170

SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE



All-Female Females

See Page 166

A SCIENCE SERVICE PUBLICATION

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PUBLIC HEALTH

Smoking Habits Studied

A year-long survey in high schools of Portland, Oreg., has found similarities in the smoking habits of students and their parents.

THE FREQUENCY of smoking among high school students depends to a large degree on the smoking habits of their parents. It is also strongly influenced by the degree to which the students participate in extra-curricular, scholastic and athletic activities.

A year-long study of high school children in the Portland, Oreg., area reveals that about one-fourth of 11,060 boys interviewed and more than one-eighth of the 10,920 girls questioned smoke regularly every week. Three-quarters smoke every day and one-quarter at least a pack a day.

The survey included 11 public high schools, five Catholic parochial schools in Portland proper, and five public schools in suburban Portland. One-fourth of the boys and one-half of the girls said they had not even experimented with cigarette smoking.

The percentage of smokers was found to be highest among children of families in which both parents smoke cigarettes, lowest in families in which neither parent had smoked, and intermediate in families in which only one parent smoked.

Where both parents smoked, 31.9% of the boys and 18.5% of the girls were regular smokers. If neither parent had been a smoker, the percentage of boys smoking was only 16.7% and the girls only 6.8%. When one parent smoked, the figures were 25.9% for boys and 13.1% for girls.

Furthermore, the percentage of smokers among children whose parents continue to smoke was shown to be significantly higher than among those whose parents had given up smoking. Smoking behavior of boys tends to conform more closely to that of the father, while smoking habits of girls follow those of the mother.

A higher proportion of smokers was found among those who were scholastically behind their age equals, among those with less ambitious academic goals, and among those who did not participate in organized sports or other school activities.

The survey also revealed that high school smoking is more widespread among students in Catholic parochial schools than among students in public schools. Thirty-two per cent of parochial boys smoked, while only 25.7% of boys in city public schools and 22.4% of boys in suburban public schools smoked.

Each successive school grade was found to have a higher percentage of smokers. Also, the percentage was shown to be inversely related to the educational level of parents, varying from 32.1% for boys and 17% for girls in families in which neither parent graduated from high school to 20.1% for boys and 10.7% for girls in families in which both parents attended college.

This study of high school smoking habits was conducted by the American Cancer Society to find the most effective way of presenting the facts about smoking to teenagers. The Society also sought more information about the amount and pattern of smoking among school students, the motivations toward smoking, and the factors that distinguish smokers from non-smokers.

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PSYCHOLOGY

Psychiatrist Interprets Second Thoughts

SECOND THOUGHTS are more revealing of mental condition than are first thoughts, it was indicated by a report by Dr. Stephen A. Appelbaum of the Menniniger Foundation, Topeka, Kans., to the American Psychological Association meeting in Cincinnati.

The famous word association test, widely used by psychiatrists to gain an understanding of patients, can be greatly improved just by repeating it and asking the patient

to give "the first word that comes to mind which is different from the one you gave before," he reported.

There is a tendency for any individual on the first trial to give a word most commonly linked with the test word in the language.

In response to "hot," for example, a person is most likely to say "cold." On the second time around, however, when he must give another word, he may say "dog," "cargo," "potato," or "mama." Such a response will give the psychiatrist a much clearer idea of the workings of his patient's mind.

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VETERINARY MEDICINE

Fido's Sniffles May Be Due To the Hay Fever Season

IF YOUR dog has the sniffles, take him to the vet for a hay fever shot.

Dogs appear to be as sensitive to ragweed pollen as humans, and require the same treatment for the allergy. For instance, a two-year-old fox terrier in southern Michigan developed a runny nose, itching and inflamed eyes during the hay fever season from August through October of 1957.

The dog was given antihistamine which relieved his symptoms until the season ended in October, Dr. Roy Patterson, University of Michigan Medical School, Ann Arbor, reports in the *Journal of the American Veterinary Medical Association* (Aug. 1).

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"PANSY" SNIFFLES—What Pansy is telling her doctor may some day help hay-fever sufferers the world over. The pup, wheezing with what one doctor described as "the worst case of hay-fever allergy I have ever seen in man or beast," has her symptoms relieved through treatment at the University of Michigan Medical Center.

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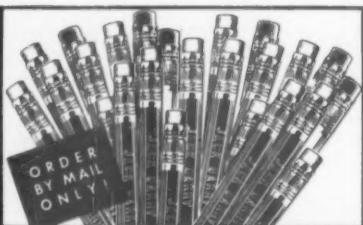
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MEDICINE

Bees Close to Snakes For Poisoning Deaths

THE BEE is almost as deadly as the rattlesnake statistically and perhaps a faster killer.

During a five-year period the common bee chalked up a grand total of 52 persons known to have died from bee stings. The notorious rattlesnake accounted for 55 deaths.

There was a total of 215 deaths, with an average of 43 a year, due to the bites and stings of venomous animals and insects, according to a report in *Archives of Internal Medicine* (Aug.).

The Hymenoptera—bees, wasps, hornets, yellow jackets and ants—killed 86 persons. In contrast, all poisonous snakes together—rattlers, cottonmouth moccasins, coral and “unidentified”—killed 71 persons. Death from bee stings was usually faster. Several hours usually passed between snake or spider bites and the victims’ deaths, while most hymenoptera stings resulted in death within one hour.

More children died of snake bite than from bee stings, reports Dr. Henry M. Parrish of the University of Vermont College of Medicine, Burlington. This is probably due to the fact that bee sting deaths are actually severe allergic shock reactions and the person must have been sensitized to the insect venom, he says.

As a result of his study, Dr. Parrish believes that previous estimates of the incidence of bites and stings by venomous animals are far too low. Although venom poisoning can not be classed as a major medical problem, he says, it is much commoner than formerly recognized.

Since the venomous animals and insects are found in every state, a physician should find out which species are indigenous to his state, become familiar with the clinical manifestations of venom poisoning, and keep up with the latest therapy, Dr. Parrish concludes.

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PSYCHOLOGY

Psychologists Differ on Causes of Mental Illness

PSYCHOLOGISTS DISAGREE about sin and guilt and its importance in causing mental illness.

“There is no place whatever for the concept of sin in psychotherapy and to introduce this concept is pernicious.” This view was expressed by Dr. Albert Ellis, practicing psychotherapist in New York.

An opposite view was expressed by Dr. O. Hobart Mowrer, research professor at the University of Illinois.

Alcoholics Anonymous, he said, provides the best indication of therapeutic programs of the future in which the psychotherapist will take guilt, confession and expiation seriously in the treatment of mentally sick humans.

Sin and unexpiated guilt lead us, Dr. Mowrer said, if not to a hell in the hereafter at least to the Hell-on-this-earth of neurosis and psychosis.

Dr. Ellis explained that he does not deny that men can do wrong or that some standard of morality is necessary as long as humans live in social groups. The psychotherapist must help his patients to accept themselves as wrongdoers and acknowledge fully their responsibility for their acts, but this does not mean that the patient must be made to feel sinful and guilty. If he keeps focusing senselessly on “What a horrible sinner, what a blackguard I am! What a louse!” he will become a compulsive wrongdoer. And, to make matters worse, he will not only blame himself but he cannot help blaming fate, circumstances or the universe.

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GENERAL SCIENCE

Betting Aids Research

Norway's soccer betting monopoly helps support first sports, then research. Considerable scientific gain has been made possible by this method.

By RICHARD LITELL

From Oslo, Norway

SCIENTIFIC research in Norway receives considerable financial support from betting profits.

The betting involves 12 weekly soccer matches. Last year's bet sales, handled by 3,889 agents throughout Norway, grossed almost \$14,000,000.

Three scientific research councils share the greater part of the betting profits. They are the Royal Norwegian Council for Scientific and Industrial Research, the Norwegian Research Council for Science and the Humanities, and the Agricultural Research Council of Norway. The money they receive can be used at the discretion of each council.

The betting profits are distributed in this manner. All of the first million kroner goes to the promotion of sports. Of the second million kroner, 200,000 go to scientific research; of the third million, 400,000 go to research; of the fourth, 600,000 go to research, and of each additional million kroner, 800,000 go to research. (One U. S. dollar equals approximately 7.10 kroner).

In 1958, the monopoly earned a net profit of almost \$5,000,000. This means more than \$1,000,000 will be allocated to sports promotion, while almost \$4,000,000 will go to scientific research. The latter \$4,000,000 will be distributed among the three councils through the Joint Committee of the Norwegian Research Councils. The amount is considered quite appreciable for a small country. The population of Norway is about 3,500,000.

The betting profits represent a sizable portion of each council's total budget. For example, about one-third of the 1958-59 budget of the Royal Norwegian Council for Scientific and Industrial Research came from betting profits. Since this council was established in 1947, it has received about \$8,500,000 from the soccer pool.

The soccer betting monopoly is independent of the Norwegian national lottery, run entirely by the Government.

Simulate Ocean Currents

HOW OCEAN CURRENTS affect fish behavior will be studied in a huge circular tank that is part of a new aquarium being built in Bergen, Norway.

The tank is three meters wide and forms the outer ring of a circular research installation 16 meters in diameter. The center of the circle contains an observation room from which scientists may observe water and fish within the tank through windows.

The ten-foot deep tank will be divided into ten sections, each separated from the observation room by two windows and each able to be closed off from the rest of the tank.

Marine scientists hope to be able to create different layers of currents within the tank by varying the density of water fed into the tank from different taps.

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BOTANY

Winter Rye Flowers Without Cold Spell

COLD-LOVING rye plants have been made to flower and produce grain without any winter and in about one-third the normal time.

This is the first time that a grass, as rye is known botanically, has been induced to produce grain without the natural cold treatment called vernalization. There is also evidence that related plants such as barley and perhaps wheat may be affected in the same way, Dr. Harry R. Highkin of the California Institute of Technology reported.

Rye and other grains that formerly could not be grown in the tropics may

now possibly be grown in these regions.

Gibberellin, a plant growth hormone, sprayed on the young rye plants at precisely the right time is the treatment used. Dr. Highkin and his co-workers, Dr. Dov Koller of Israel and Osvaldo H. Caso of Argentina, found that if gibberellin is applied when the plant has ten leaves, which occurs at about one month, early grain is produced.

The young rye plants were grown under controlled conditions at Caltech's Earhart Plant Research Laboratory. A constant temperature of 62 degrees was maintained. A relatively weak solution of gibberellin was used, only 200 parts per million parts of water. The spraying was carried on for seven consecutive days.

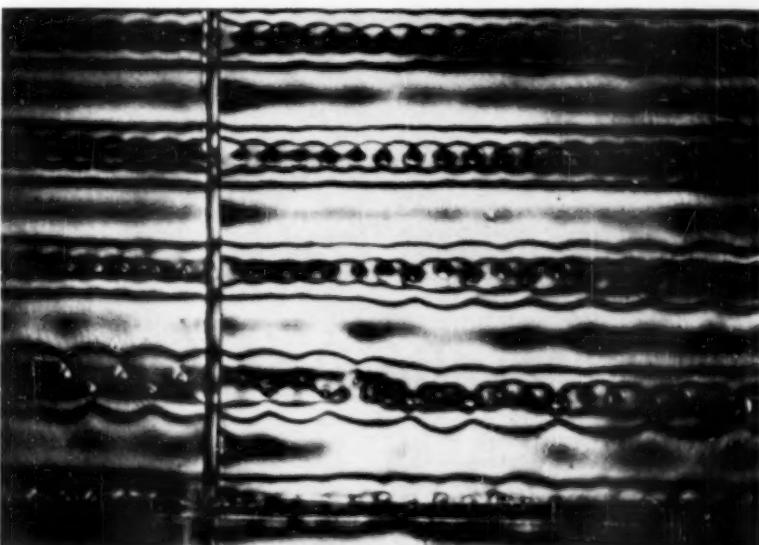
"The method is simple and it is practical commercially," Dr. Highkin said. For experimental purposes, two and possibly three generations of winter rye can be raised in one season in a greenhouse.

It is still not known what takes place when grasses flower without vernalization. Two hormones, gibberellin and florigen—the hormone or hormones that the plant secretes to produce flowers—are believed to be involved.

Indications are that spraying at even the nine-leaf stage produces less successful results. Further there is evidence that results grow progressively worse the earlier the spray is applied. Experiments are under way to explore these findings, and also to determine how quickly grain can be produced by spraying plants that have 15 leaves.

These experiments should show how much gibberellin should be used and when the best time for spraying occurs.

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PHOTOSTRESS PLASTIC—This new quantitative stress analysis tool converts strain into color so that the strain pattern in an actual part can be seen. Here PhotoStress plastic is applied to a spot welded stainless steel aircraft structure. Dark lines in the plastic are fringes indicating stress distribution around the welds. The distribution of loads between the lines of welds can thus be determined.

BOTANY

Mushrooms Aid Mental Ills

THE MENTALLY ILL may be able to get peace and quiet with their steak and mushrooms, providing they eat some special mushrooms described at the 9th International Botanical Congress meeting in Montreal.

The clue to the possible medical usefulness of these mushrooms was uncovered as a result of studies of the Mexican Indians and their religious rituals, Dr. Roger Heim of the Natural History Museum, Paris, reported.

For some years it has been known that the native Mexicans eat certain mushrooms because of their "miraculous" hallucinogenic effects. After eating the mushrooms, the Indians would have visions. Taken in large enough quantity, however, the plant is known to have a dangerous effect. Poor, discouraged Indians have been known to take their own lives after a "calming" meal of mushrooms.

After years of research in several European laboratories, scientists are now ready

with a synthetic substance that duplicates some of the beneficial effects of the mushrooms. Taken in large doses, as he did himself for experimental purposes, the substance is a powerful hallucinogen, Dr. Heim said. In small, therapeutic doses its effects can be beneficial. It is not habit-forming. However, in its present form, different persons have different reactions.

There are 15 species of mushrooms, many of them new to the scientific world, that have this hallucinogenic effect: 14 are in the *Psilocybe* group while one is in the *Stropharia* group of mushrooms. Dry mushrooms contain about 0.3 to 0.5 percent psilocybin. In his laboratory in Paris, Dr. Heim has grown about 11 of these mushrooms. It is possible to grow them on a semi-industrial scale. Analysis, carried out with chemist A. Hofmann, showed that indole substances were the ones involved. Further chemical research is being carried, out, as well as medical studies.

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GENETICS

Inherit Prostate Cancer

THERE IS A definite tendency for cancer of the prostate gland to "run in families," a scientist reported to the American Society of Human Genetics meeting at University Park, Pa.

In a study of 228 families of men who had died of prostate cancer, 15 male relatives were identified as having died of this disease. This is three times the number found in a control group, said Dr. Charles M. Woolf of the Laboratory of Human Genetics, University of Utah.

This supports the theory that this cancer is influenced by a gene that affects only one organ—the prostate gland. In addition Dr. Woolf reported, there were more deaths from other types of cancer among the families of the study group than in the control group. This number—35 cancer deaths as compared with 24—could be due to chance, he pointed out, but it may reflect incor-

rect diagnosis. It is possible that these cancers originated in the prostate gland and that the disease later affected other organs.

Female relatives of the study group had no more cancer deaths than did the controls.

Persons of the same sex and approximately the same age, who had died in the same year and place as those persons who had died of prostate cancer, made up the control group.

Other researchers have shown that several kinds of cancer are apparently influenced by genes that interact with non-genetic factors, Dr. Woolf said. Stomach cancer and breast cancer are two forms of the disease in which an "etiological role for heredity" has been shown, he said. Results of his study indicate there is also a familial tendency for prostate cancer.

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ANTHROPOLOGY

Skull May Be Ape Man

THE ANCIENT fossil skull reported by Dr. Louis Leakey as discovered in Tanganyika, Africa, may be a lingering example of the Australopithecine ape-man. This suggestion is made by a scientist at the Smithsonian Institution.

The skull, estimated to be 600,000 years old, is reported to have a brain capacity of 600 cubic centimeters. This is probably within the range of brain size of the African ape-man, which is estimated to have varied from about 450 cubic centimeters to about 700. Some gorillas have a cranial capacity of 600 cubic centimeters, but these

are massive creatures so that the brain size is not so large in proportion to body size.

If Dr. and Mrs. Leakey, who made the discovery, follow the usual custom of anthropologists, casts will be made of the ancient skull and sent to anthropologists throughout the world for independent study. The Smithsonian in Washington has a large collection of such casts.

Anthropologists in the United States as well as elsewhere in the world will await with great interest receipt of such casts and the complete scientific report of this important find.

The Pleistocene, the geologic era during which the fossil creature lived, lasted a little less than a million years and started about a million years ago. It is divided into three parts by anthropologists. The early Pleistocene is represented only by the Australopithecines, the African ape-men. This early form used for tools only small stones picked up and crudely chipped for immediate use. In the middle Pleistocene lived *Pithecanthropus*, the ape-man, including the famous Peking Man, Java Man and other ancient Asian forms. These later creatures learned how to fabricate stone tools on definite patterns. Then began the passing on of skills and the specialization of tools for particular purposes. In the late Pleistocene came Neanderthal and *Homo Sapiens*.

Science News Letter, September 12, 1959

ICHTHYOLOGY

Guppy-like Fish Produce Only Female Offspring

See Front Cover

Two kinds of "all-female females" have been discovered by Robert T. Miller, Associate Professor of Zoology at the University of Michigan. These fish belong to the genus *Bucciliobius*, the same family as guppies.

Professor Miller has isolated about 16 species, 14 of which have normal reproduction. The other two are unique because their offspring include all-female females. The photograph on the cover of this week's SCIENCE NEWS LETTER shows one of these unusual guppy-like females. Each of the two species has two kinds of females. One is normal and the other is all-female, producing daughters even though she mated with the same male that fathered the normal ones. The only difference between the two is in teeth structure.

Science News Letter, September 12, 1959

BIOCHEMISTRY

How Plant Chemical Works Is Still a Mystery

THE "SUBAPICAL" STEM tissues are the ones most affected by the gibberellins, Dr. Roy M. Sachs of the University of California told the American Institute of Biological Sciences meeting at University Park, Pa.

These are the tissues below the youngest of apical tissues, such as the tip of the stem. From 20 to 24 hours after treatment with gibberellic acid, cell division, an increase in cell numbers, was 10 to 30 times greater than in untreated plants. This activity was greatest in the subapical tissue.

One observation, Dr. Sachs said, has been that the gibberellic acid gets to the active sites in the plant tissue in less than two hours. If the "primary" effect of the gibberellins is unknown, there is still ample evidence that it acts within two hours.

The fact that cell walls become more plastic within two hours after gibberellin is applied may be related somehow to the fact that cell division activity also increases at the same time.

Science News Letter, September 12, 1959

OCEANOGRAPHY

Urge Oceanographic Aid

Oceanographers recommend international cooperation in marine sciences and point out the need for ocean research and conservation of marine resources.

TOP OCEANOGRAPHERS have urged the United States to give full support to international cooperation in the marine sciences. The ultimate oceanographic goal, they said, should be a planned survey of all the world's oceans.

Such a survey would require about 40 ships operating during a ten-year period making measurements along lines five miles apart. Additional ships would be needed to measure physical, chemical and biological contents of the oceans. Only cooperation among the major maritime powers could accomplish this task.

International cooperation is also needed for such efforts as the planned combined assault on the Indian Ocean which is the largest unexplored area on earth, the location and utilization of fishing grounds, the search for mineral resources on the ocean bottom, and the regulation of submarine operations.

Adoption of regulations to prevent pollution of the sea by radioactive waste material and the seemingly paradoxical use of radioactive tracers to study currents and diffusion in the deep sea also require concerted efforts.

The Committee on Oceanography of the National Academy of Sciences-National Research Council urged the Government to go all out to support world-wide cooperation. The latest chapter of its report on the next ten years in oceanography contains six specific recommendations toward this end.

The Committee urges the United States

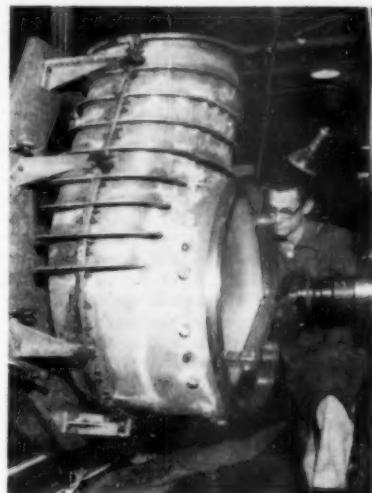
to "give its proportionate share" of financial, estimated at perhaps \$20,000 a year, and other support to the Special Committee on Oceanic Research of the International Council of Scientific Unions. ICSU is the world's principal institution for international cooperation at the non-governmental level.

The Committee also recommends calling an inter-governmental conference of marine countries to discuss ways to cooperate in increasing man's knowledge of the oceans. This conference should be a first step toward establishment of a World Oceanographic Organization, to be a specialized agency of the United Nations.

The State Department, the Committee says, should be prepared to assist research ship operations and the exchange of information, persons, equipment and supplies. Similarly, the International Cooperation Administration, in its programs of technical assistance, should give greater emphasis to marine resources surveys and to research ship operations and training programs in the marine sciences.

Other recommendations included the seeking of grants from foundations and governmental sources to support special projects, and Government support in the establishment and support of regional international organizations for the study and conservation of the living resources of the sea.

Science News Letter, September 12, 1959



NUCLEAR SCROLL — In stainless steel spiraling ducts, like the one above, heat from a nuclear reactor is collected and pushed through a jet engine. Tests using these engines (General Electric X-39) have been made at the Atomic Energy Commission's site at Idaho Falls, Idaho.

ASTRONAUTICS

Soviet Lunar Rocket Aimed to Hit Moon

THE SOVIET MOON rocket, now in permanent orbit around the sun, was aimed to hit the moon, not merely to come close.

This is the conclusion of the staff of the House Committee on Science and Astronautics, based on a survey of all available evidence and ten hearings at which space experts testified in public and private sessions. The staff report summarizes findings on the first moon rocket, now called Mecha for "dream," which was launched Jan. 2, 1959.

The evidence that Lunik, as it was first named, was intended to hit the moon is circumstantial, not direct. The payload included equipment for measuring the moon's radioactivity and magnetic field. Such experiments could not be carried out at any great distance from the moon, but for all practical purposes assume a lunar impact.

The payload also included metal tapes and a sphere with Soviet inscriptions. The report concludes that these were intended to support a territorial claim by symbolic occupation of the moon. The sphere was inscribed, "Union of Soviet Socialist Republics. January—1959—January," as were the pennants.

The report also emphasized again Soviet progress in space technology, and the efforts that must be made by the United States to catch up with Russians.

The report, "The First Soviet Moon Rocket," was prepared by the Committee's special counsel, Spencer M. Beresford, in collaboration with Dr. Charles S. Sheldon II, technical director.

Science News Letter, September 12, 1959

ASTRONAUTICS

Space Fuel Economized

Using energy belts in space, such as the Van Allen radiation belt, scientists hope some day to obtain free fuel for space travel.

SPACESHIPS SOME DAY may "cruise almost indefinitely on free space fuel."

This was described in a Report of the House Committee on Science and Astronautics as "perhaps the most imaginative idea of all" concerning present and future space propulsion methods.

It would involve charting and using plasma or energy belts found in space. Such an energy belt exists around the earth, the Van Allen radiation belt, named after the Iowa State College physicist who discovered it. Data on the Van Allen belts have been gathered by instruments in several Explorer satellites.

Such an idea lies outside the two cate-

gories into which the Committee classified space propulsion programs.

The first grouping, achievable in five years, included improving the chemistry of liquid and solid propellants. Theoretically, the energy-carrying capacity of these fuels can be upgraded 50%, the Committee said.

The second grouping, in which the "problem" will be defined in about five years and solutions may begin to appear in ten, includes harnessing nuclear and electric power. A less conventional propulsion system might use free radicals—highly reactive parts of broken molecules.

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MEDICINE

Bone Cancer Seasonal In Young Men and Women

THERE IS A SEASON for bone cancer. A study of bone sarcomas or tumors in some 74 persons indicates there is a seasonal rhythm in the onset of symptoms. There were more tumors during the months June through November than for December through May, a researcher reports in *Nature*.

Dr. C. H. G. Price of the University of Bristol says that patients under 30 years of age with tumors of the long bones were asked when they first complained of any "definite symptoms" directly related to their bone tumor. About nine cases a month had bone pain, or pain and local swelling, first apparent in the summer and fall; the winter and spring averaged about three cases a month. These differences do not appear in persons older than 30 years of age, Dr. Price points out.

This "summer incidence" in bone tumors appears about three months after the spring peak in bone-growth. Possibly there is a "biological linkage" between the spring growth and the subsequent appearance of bone tumors, the British scientist suggests.

Science News Letter, September 12, 1959

ASTRONOMY

Solar System Studied At Short Wavelengths

ADVANCES IN KNOWLEDGE about the moon and nearby planets in the solar system are being made by studying the radiations they broadcast at short wavelengths, ten scientists from the U. S. Naval Research Laboratory, Washington, D. C., and Columbia University have reported.

Dr. Robert J. Coates of NRL told the American Astronomical Society meeting that maps of the moon at wavelengths of about one-fifth of an inch showed "distinct features." Some areas, he said, are hotter and some are colder than their surroundings. The brightness distribution of the moon varies with the lunar phase and depends on the wavelength used.

Radar measurements of the moon's mean distance indicate its center is close to 24,025 miles from the earth's center, Drs. R. H. Bruton, K. J. Craig and B. S. Yaple of NRL reported. Using this distance, they have calculated that the mean equatorial radius of the earth is about 3,986 miles.

Observations of Jupiter and Mars at wavelengths of about one inch were reported by Drs. J. A. Giordmaine, L. E. Alsop and C. H. Townes of Columbia University and Dr. C. H. Mayer of NRL. They believe the radiation they found from Jupiter is due to heat emitted by ammonia in the region near the top of the cloud layer. The observations were made with NRL's 50-foot steerable reflector with a maser amplifier at the focus.

At wavelengths of four inches, Dr. Russell M. Sloanaker of NRL said he found a mean temperature for Mars of about 692 degrees Fahrenheit. This temperature, he reported, is three or four times higher than

that found at wavelengths slightly longer than one inch. There may be a cyclical variation in the Martin temperature, correlated with its rotation rate, he said.

At wavelengths of 21 centimeters, or slightly more than eight inches, Dr. Edward F. McClain of NRL attempted to correlate the possible variable temperature of Jupiter noted by other radio astronomers with the density of solar particles as indicated by magnetic storms on earth. No correlation was found, but he did discover a "slight suggestion" of elevated temperatures on Jupiter following a major flare on the sun on May 10.

Science News Letter, September 12, 1959

CHEMISTRY

Free Radicals Show Trend to Cryogenics

THE GREAT PROMISE of a new energy source—the use of free radicals trapped in their reactive state—is not in rocket propellants, as once thought, but in chemistry and physics.

Much progress is being made in understanding these fragments of molecules that usually exist only for thousandths of a second. For three days (Aug. 31 to Sept 2), more than 400 scientists from the United States, Canada, Great Britain, Sweden and Russia met in Washington to exchange their latest research findings on free radicals.

Particular emphasis was given to trapping of free radicals at very low temperatures, within a few degrees of absolute zero, which is 459.7 degrees below zero Fahrenheit. The study of free radicals has pointed up the present-day trend toward low-temperature chemistry, Dr. H. P. Broida of the National Bureau of Standards told SCIENCE SERVICE. Dr. Broida headed a three-year program at NBS in which Government, university and industrial scientists cooperated to learn more about the physical and chemical properties of free radicals.

One possible practical application of free radicals, he suggested, could be in an infrared detecting device. Free radicals occur in the chemical reactions of living tissue, in the hot atmospheres of the sun and other stars, and in automobile and rocket engines. They are formed when molecules are broken up by applying energy to them.

Science News Letter, September 12, 1959

EDUCATION

Supplementary Training For Science Teachers

A PROGRAM to further science education will benefit some 10,000 teachers in after-hours training during 1960-61.

The National Science Foundation will support about 200 In-Service Institutes for Secondary School Teachers of Science and Mathematics.

This program is designed to assist colleges and universities to encourage teachers in local and outlying school districts to take advantage of further scientific training facilities.

Science News Letter, September 12, 1959

IN SCIENCE

BOTANY

Dwarf Mistletoe Seeds Are Faster Than Rocket

THE INITIAL ACCELERATION of a tiny seed in flight is thousands of times faster than that of a man-made rocket.

The explosive seed of the dwarf mistletoe gets shot out of its pod at an initial acceleration of some 5,000 g's. In contrast, a typical satellite-launching rocket's initial acceleration is between five and ten g's.

"As far as I know," reports F. G. Haworth of the U. S. Forest Service, Fort Collins, Colo., "no calculations have been made of the initial velocity or other ballistic factors of the dwarf mistletoes or any other higher plants with explosive fruits."

He reports in *Science* (Aug. 28) that the seeds have an initial velocity of about 1,370 centimeters per second or about 45 feet per second. This compares with a rocket's escape velocity of about 36,800 feet per second.

The seed's shape approaches the "ideal" for the most efficient projectile, Mr. Haworth says. Its forward end is rounded and the other end is pointed.

Science News Letter, September 12, 1959

MEDICINE

Fever Must be Nourished Not Starved, Doctors Say

THE OLD SAYING "feed a cold and starve a fever" is wrong.

A fever must be watered and fed, not starved, warn two physicians at the Medical Research Institute of Michael Reese Hospital in Chicago.

Fever leads to the breakdown of body tissues, Drs. Rachael Levine and Sidney Cohen report, and the body loses water. At high temperatures the body cells work and break down faster. When a fever reaches 103 degrees Fahrenheit or more, it becomes dangerous, they said. The central nervous system does not function normally and high fever can injure the heart.

A child's body temperature will react more sharply with a fever than does an older person's. Reactions to fever-causing agents are slower and not as drastic in the older person, Drs. Levine and Cohen report in *Today's Health* (Sept.).

There is no general remedy for fever, they say. Fever caused by infection is reduced by eliminating the infectious agent. Other causes of fever include food intake, excessive fatigue, hypersensitivity to drugs, cirrhosis of the liver and pregnancy. Fever, the scientists point out, is not a disease but rather a symptom which should be thoroughly investigated by a medical doctor. Some persons, however, have a normally higher-than-average temperature.

Science News Letter, September 12, 1959

SCIENCE FIELDS

MARINE BIOLOGY

Surface Organisms Live In Deep Water Pressure

MARINE ORGANISMS that normally live in surface waters can survive the greatly increased hydrostatic pressures found in deeper water.

A Japanese scientist told the International Oceanographic Congress in New York that such organisms can tolerate both a great and a rapid change in hydrostatic pressure.

Kazuo Sano, of the Fisheries Department at Tokyo University, reported the results of a deep-sea survey of the Japan Trench from a diving sphere, carried out by Japanese and French scientists last summer.

He found that surface organisms could survive a pressure change from one atmosphere to 300 atmospheres within a few hours. One atmosphere equals 14.7 pounds to the square inch.

Except for the knowledge that some animals migrate daily from deep water to the surface and back, the scientist reported, little has been known about how surface animals fared in deep water with high pressures.

The organisms involved in the survey were species of green algae, bryozoans, bivalves and crustaceans.

Science News Letter, September 12, 1959

PSYCHOLOGY

Attitude of Attendant Affects Mental Patient

THE HOSPITAL ATTENDANT who hates Negroes, Catholics or Jews is likely to have the same attitude toward mental patients and treat them as dangerous and having low status.

Unfortunately, this kind of attitude is held by more than half, 54%, of the personnel in a large mental hospital.

This was shown by a study of the attitudes toward patients in the Franklin D. Roosevelt Veterans Administration Hospital at Montrose, N. Y. Results were reported by Dr. Jacob Cohen of New York University and Dr. E. L. Struening of the Montrose VA Hospital at the American Psychological Association meeting in Cincinnati.

In the past decade, it has become more and more evident that mental patients are sensitive to and influenced by the atmosphere created by hospital employees. Similarly, the success of former mental patients in re-adjusting to society is affected by the attitudes of the general public.

Five types of attitudes were found among the personnel at Montrose. Attitude A, called Authoritarianism, is the one held by those swayed by racial and religious prejudice. This is the attitude that looks on mental patients as unpredictable and dangerous and considers that society needs

protection from them by confining them behind locked doors.

By contrast, psychiatrists, psychologists and social workers have the attitude that "patients are people," and consider that mental patients have more similarities than differences from non-patients. They also emphasize a belief in the efficacy of hospital treatment.

However, these professionals' people spend relatively little time with the patients. The attendants and nurses who provide the hour-to-hour social atmosphere around the patients do not generally subscribe to this attitude C, held by only 12%.

A slightly higher percentage, 13%, have a kindly paternalistic attitude toward patients and regard them as unruly children who need to be cared for and gently supervised—attitude B.

Attitudes D and E, are each held by about 10% of the personnel. One emphasizes the need to restrict patients both during and after hospitalization to protect society. The other is concerned with the importance of interpersonal relationships, especially early love deprivation.

Science News Letter, September 12, 1959

ASTRONOMY

New Method for Finding Mass of Mars Proposed

A METHOD for finding the mass of Mars was reported to the American Astronomical Society Meeting in Toronto.

Dr. Eugene Rabe of the University of Cincinnati Observatory said observations of a tiny minor planet, the asteroid known as Laodamia, could give the mass of Mars "to a very considerable degree of accuracy." The asteroid, he reported, causes changes in the orbital motion of Mars "many times larger" than the effects of Mars on the orbital motion of Laodamia.

Although the minor planet is very faint, a sufficient number of accurate observations when the two objects are close would give the Martian mass. In March, 1961, Mars and Laodamia will come within some 9,300,000 miles of each other, a "close" approach astronomically speaking. The mass of Mars is calculated to be about one-tenth that of the earth.

Science News Letter, September 12, 1959

GEOPHYSICS

Detailed Information on High H-Bombs Reported

DETAILED INFORMATION on the effects of hydrogen bombs exploded high over the Pacific Ocean more than a year ago are reported in three separate papers in *Nature*.

Five New Zealand scientists and a Japanese scientist working in the United States described the effects produced by the H-bomb blasts on the radio-reflecting ionosphere and the earth's magnetic field, and in causing auroras. The bombs were exploded high in the atmosphere over the Pacific Ocean near Johnston Island on Aug. 1 and 12, 1958.

Science News Letter, September 12, 1959

BIOCHEMISTRY

Radiation Therapy for Cancer Improved

A CHEMICAL COMPOUND has been found that reduces the amount of cancer-killing radiation needed to treat patients with this dread disease.

BUDR, or 5-bromodeoxyuridine as the compound is known, "dramatically" and "strongly" improves the killing effects of radiation, Dr. Waclaw T. Szybalski of the Rutgers Institute of Microbiology reported.

Apparently growing cells accept BUDR as a substitute for thymidine. It is very similar to this chemical, a compound normally found in the cell's deoxyribonucleic acid (DNA). Once the growing cells have accepted BUDR, they are much more likely to die from radiation, Dr. Szybalski told scientists attending the Genetics Society of America meeting as part of the American Institute of Biological Sciences at University Park, Pa. In one experiment, he pointed out, a radiation level that killed only 50% of normal cells, killed 99.99% of the BUDR-treated cells.

In other experiments only one-tenth as much radiation was needed to kill BUDR-treated cells as was needed for normal cells.

Since many cancer cells multiply in the body much more rapidly than normal cells, Dr. Szybalski suggested that it may be possible to increase selectively the radiation sensitivity of cancerous tissue. Much of the research in the field of cancer treatment has been directed at delivering higher and higher doses of radiation to the cancer cells, the scientist said.

He was assisted in his studies by Bozidar Djordjevic, a graduate student from Yugoslavia.

Science News Letter, September 12, 1959

AGRICULTURE

Trees Protected Against Fungus Growth Infection

AN ANTISEPTIC PAINT may soon be available for the home gardener's wounded trees.

A fungus-killing chemical has been added to the asphalt varnish used in painting tree wounds. It prevents growth of fungi, tiny plants that cause decay in shade trees, and it may keep decay out of wounds made by pruning or trimming trees, two U. S. Department of Agriculture scientists have found.

The antiseptic quality of asphalt varnish containing 0.25% phenyl mercury nitrate was established in laboratory experiments, Dr. Curtis May and John G. Palmer told the American Phytopathological Society meeting in University Park, Pa. The varnish alone, or with several other common fungicides, was not effective against the tree-rotting fungi, they said.

It may now be profitable to industry to market the fungicide varnish for the home gardener's use. The scientists cautioned against "mixing your own" antiseptic varnish since the mercury compound is highly toxic.

Science News Letter, September 12, 1959

ENGINEERING

Lighting in Any Shape

Electroluminescence, a way to convert electricity directly into light, could illuminate our homes in the not-too-distant future.

By STEPHEN BRONZ

WINDOWS, wallpaper, and draperies that glow to light the home at night could be standard equipment in the not-too-distant future. Electroluminescence, hailed as the most important lighting discovery since Edison's incandescent lamp and the fluorescent bulb, will be responsible.

The possible uses of electroluminescence stretch the imagination. The lights need not be in set shapes of bulbs or tubes. Electroluminescence can provide area lighting, two-dimensional lighting that can come in any shape. Thin layers, a few thousandths of an inch thick, of an electroluminescent source might be used to cover ceilings and walls. Windows coated with the material could transmit sunlight in the day and light the room at night.

Direct Conversion

"Electroluminescence" is a way to convert electricity directly into light. It can be accomplished by exciting a thin film of phosphors with an alternating current. The phosphor film is sandwiched in between two electrically conductive surfaces, at least one of which is translucent. The "bread" of the sandwich can be a mesh of tin oxide, no thicker than the "meat."

When the alternating current is sent through the outer layers, an alternating electric field is set up across the phosphors in the middle. The electric field "excites" or energizes the electrons in the phosphor layer. Essentially, as the electrons "calm down" they emit their excess energy in the form of light.

This method is akin to the principle behind fluorescent lamps and television sets. In all three light is produced by exciting a phosphor. In a fluorescent lamp, light is produced by the action of ultraviolet rays. Television sets show pictures because of a beam of high-speed electrons. Electroluminescent sources glow because the phosphors are excited by an electric current.

In one respect electroluminescence is different from previous forms of electric lighting. The electricity is converted directly into light. There is no tungsten filament to heat white-hot as in the ordinary incandescent light bulb. The electricity does not have to be converted into ultraviolet radiation to produce, in turn, fluorescent lighting.

Versatile electroluminescence can change colors as quickly and as easily as the intriguing chameleon. A turn of a knob might change the color of the light from blue to red or white.

Technically, the colors are varied by mixing different phosphors or by changing the frequency of the alternating current. As

the frequency changes, different colors inherent in the electroluminescent source are emphasized.

Electroluminescence can also form an image. A photoconductor, a material that conducts electricity in proportion to the amount of light falling upon it, is placed in front of electroluminescent material. When an image is focused on the photoconductor and when electricity is applied to the two layers, the photoconductor will translate the image into an invisible picture of varying voltage.

The varying voltage, in turn, will be translated into a picture by the phosphors in the electroluminescent screen. The device can "see" things beyond the visible spectrum. It could be used to give a brighter X-ray picture than is now possible with a fluoroscope.

If an electroluminescent screen can be made to perform the function of a television tube, as it may well be made to do, television sets no thicker than a painting could be hung on the wall. The bulky picture tube would be eliminated because the electroluminescent screen would translate the electric impulses into a picture without the intermediate step of bombardment by high-speed electrons.

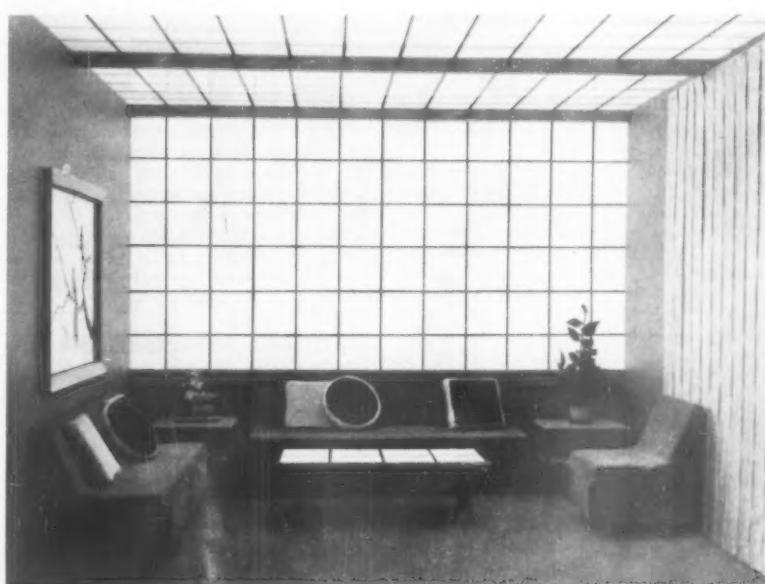
There is a considerable amount of electroluminescent lighting in use today. Electroluminescent panels are now used as night plotting boards for the bridges of ships, instrument dials, and night lights for the homes. The 1960 Chrysler and Imperial automobiles will have electroluminescent panels illuminating their dashboards.

Sandwich Structure

The panels, the most extensively used form of electroluminescence at the present, are made by coating a plate of glass with an electrically conductive layer. On top of this is placed the powdered phosphor layer embedded in plastic film. To complete the sandwich the inside surface of a protective moisture barrier is coated with a dielectric, or conductive layer, made perhaps of aluminum.

When a wire connected to the dielectric layer is plugged into an electric circuit, the panel glows. Instead of a glass-based panel, ceramic, plastic or nylon might be used. With a nylon light source, soft draperies could be plugged into the electric outlet and made to glow.

Before our homes are lighted by glowing ceilings, however, some major problems must be ironed out in the laboratory. Electroluminescence still is too costly to compete with filament, fluorescent or mercury lighting, except where only a dimly glowing panel is needed, because the sources have a low brightness and a low



ELECTROLUMINESCENCE AT HOME — This prototype living room built by Westinghouse has a luminous ceiling, windows, mural and coffee table. The windows transmit sunlight in the day and emit a soft glow at night when plugged into a circuit.

efficiency at regular levels of voltage and frequency.

The brightness of the light can be increased in two ways. The strength of the current can be increased by raising the voltage or by quickening the frequency of the alternating field's oscillations.

Both, however, have technical limits. Too strong a current will destroy the insulating properties of the phosphor film and too rapid a frequency will not give the electrons enough time to get "excited," to "calm down," and to emit light.

Even disregarding technical limits, the voltage and frequency of the electrical system would have to be raised to make a panel bright enough to light a room with electroluminescence. Consequently, a luminous ceiling would cost an estimated \$12,000, ten times as much as a luminous ceiling of fluorescent lamps behind diffusing plastic.

Considerable progress has been made since intensive research on electroluminescence began in 1950. America's three largest electric light manufacturers, General Electric, Westinghouse and Sylvania, are conducting extensive laboratory research programs on electroluminescence.

Although low-cost electroluminescence is not just around the corner, it could occur within the next decade. Windows, wall-paper and draperies may light the home.

A Soviet physicist, in 1923, made the first known observation of electroluminescence.

At the city of Nizhni-Novgorod, Oleg Vladimirovich Lossev discovered that a crystal of silicon carbide properly oriented between two direct current electrodes will glow. Thirteen years later, a French scientist, Georges Destriau, found that an alternating current could excite sulfide phosphors to produce light.

However, as Prof. Destriau recently recalled, his electroluminescent source was so dim that "you had to turn out the lights and adapt your eyes to the darkness before you could glimpse its faint light."

Indeed, these early efforts were considered mere laboratory curiosities. It was not until 1950 that industry became interested in electroluminescence.

Science News Letter, September 12, 1959.

GEOPHYSICS

Radioactivity Found High Off Antarctic Continent

THE AMOUNT of radioactivity in the waters of the Pacific Antarctic is more than twice as great as the natural amount.

Mr. B. A. Nelepo of Moscow State University told the International Oceanographic Congress meeting at the United Nations headquarters in New York that this radioactivity was uniformly distributed over a vast area, indicating that the contamination was caused by the fallout of radioactive products from the atmosphere.

The measurements on which he based his results were taken last year in the south Pacific adjacent to the Antarctic continent east of the Balleny Islands.

The region of highest activity, he said, was found to be the upper mixed layer of ocean water, about 50 yards in depth. Radioactivity decreased considerably with depth in the layer between 50 and 150 yards.

Science News Letter, September 12, 1959

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Master the Basics of Digital Computers by John S. Murphy

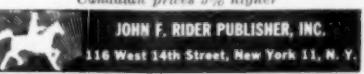
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Books of the Week

For the editorial information of our readers, books received for review since last week's issue are listed. For convenient purchase of any U. S. book in print, send a remittance to cover retail price (postage will be paid) to Book Department, Science Service, 1719 N Street, N.W., Washington 6, D.C. Request free publications direct from publisher, not from Science Service.

THE AAAS SCIENCE BOOK LIST—Hilary J. Deason—*Am. Assn. for the Advancement of Science*, 140 p., paper, \$1. A guide to recreational and collateral reading and to basic reference works in the sciences and mathematics for junior and senior high school students, college undergraduates and non-specialist adults.

ANCIENT SCIENCE AND MODERN CIVILIZATION—George Sarton—*Harper*, 111 p., paper, 95¢. Reprint of three essays on the times of Euclid and of Ptolemy, and the end of Greek science and culture.

BASIC DATA OF PLASMA PHYSICS—Sanborn C. Brown—*Technology Press & Wiley*, 336 p., illus., \$6.50. Graduate course in gas discharges, specifically prepared for an M.I.T. course in plasma dynamics.

THE CHEMICAL WARFARE SERVICE: Organizing for War—Leo P. Brophy and George J. B. Fisher—*Off. of Chief of Military Hist. Dept. of Army (Govt. Print. Off.)*, 498 p., illus., \$4. The history of gas warfare preparations during World War II.

THE EARTH SHOOK, THE SKY BURNED—William Bronson—*Doubleday*, 192 p., 400 photographs, \$5.95. Depicting the destruction of San Francisco, following the earthquake of April 18, 1906, in the words of a California journalist with on-the-scene photographic record.

ECHOES OF BATS AND MEN—Donald R. Griffin—*Doubleday*, 156 p., illus., paper, 95¢. Tells of the interplay between sound waves and the animals and men who use them, including the physics of seeing with sound waves, told for young students and laymen.

EXPLORING THE STRUCTURE OF MATTER—Jean-Jacques Trillat, preface by Maurice de Broglie and Louis de Broglie, transl. from French by F. W. Kent—*Interscience*, 214 p., illus., \$4.85. Deals with micrography by X-rays and by electrons, electron microscopy and its applications, and diffraction of material particles.

GREAT EXPERIMENTS IN PHYSICS—Morris H. Shamos, Ed.—*Holt*, 370 p., illus., \$4.40. The original accounts of 24 experiments that created modern physics, annotated by the editor, with short biographies of the great physicists.

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INDUSTRIAL ACCIDENT PREVENTION: A Scientific Approach—H. W. Heinrich, ass't by E. R. Granniss—*McGraw*, 4th ed., 480 p., illus., \$9. Tested methods for achieving greater safety and efficiency, and for eliminating costly accidents in manufacturing and construction work.

AN INEXPENSIVE SCIENCE LIBRARY: A Selected List of Paperbound Science Books—Hilary J. Deason and Robert W. Lynn—*Am. Assn. for the Advancement of Science*, 3rd ed., 59 p., paper, 25¢. New features of the present edition are a brief descriptive note for each book, and the classification of each title as to degree of difficulty.

INFORMATION AND ERROR: An Introduction to Statistical Analysis—Solomon Diamond—*Basic Bks.*, 307 p., \$5. Fundamentals of analytic techniques and their uses in statistical psychology.

INTRODUCTORY NUCLEAR THEORY—L. R. B. Elton—*Interscience*, 286 p., \$6.40. Graduate course of theoretical nuclear physics.

THE LITTLE NATURALIST—Frances Frost—*Whittlesey House*, 48 p., illus. by Kurt Werth, \$2.50. Poems about small animals for young readers.

MAPPING THE WORLD: A Global Project of the Corps of Engineers, U.S. Army—C. B. Colby—*Coward-McCann*, 48 p., illus., \$2. Shows in picture and word the highly skilled and complicated operations used in surveying and map making.

MEN, MOSS AND REINDEER: The Challenge of Lapland—Erik Berry—*Coward-McCann*, 96 p., illus., \$2.50. Tells young people how the Lapps live, how men make a living north of the Arctic Circle.

MODERN SCIENCE DICTIONARY: Astronomy, Biology, Chemistry, Geology, Meteorology, Physics—A. Hechtl—*Franklin Pub. Co.*, 784 p., illus., \$10. More than 15,000 concise definitions and biographical data, useful to students, teachers and the general reader.

NEW INSTRUMENTS AND METHODS OF ENGINEERING GEOLOGY—N. V. Glazov and A. N. Glazov, transl. from Russian by J. Paul Fitzsimmons—*Consultants Bureau*, 91 p., illus., \$3.25. Russian review of present methods and equipment used by engineering geologists and hydrologists.

NOISE CONTROL IN BUILDINGS: Proceedings of

1959 BRI Conference—John S. Parkinson, Chmn.—*Building Res. Inst.*, NAS Publication 706, 150 p., illus., paper, \$5. Examines acoustics and noise control problems created by lighter weight construction, high velocity mechanical equipment, ventilating and communication systems, and other modern devices.

NUCLEAR ELECTRONICS, Vol I: Proceedings of the International Symposium on Nuclear Electronics, Paris 1958—International Atomic Energy Agency (International Publications, N.Y.), 452 p., illus., paper, \$4. Papers in English and French, of interest to nuclear and electronic scientists and engineers.

PHENOLIC RESINS—David F. Gould—*Reinholt*, 213 p., illus., \$5.75. Survey of the properties and applications of phenolics, useful to the engineer, manufacturer and student.

PHOTOTUBES—Alexander Schure, Ed.—*Rider*, 88 p., illus., paper, \$1.80. Helps student understand the fundamentals of photoelectricity, photoemissivity theory, and the structure of vacuum and gas-filled phototubes.

POWER AND MORALITY: Who Shall Guard the Guardians?—Pitirim A. Sorokin and Walter A. Lunden—*Sargent*, 202 p., \$3.50. Sociologist's and criminologist's inquiry into the power position of political bosses and rulers of governments, with suggestions of how to limit this power in the interest of mankind.

PROGRESS IN CRYOGENICS, Vol I—K. Mendelsohn, Ed.—Academic, 259 p., illus., \$11. Up-to-date information on developments in low-temperature research, such as frozen free radicals, thermoelectric cooling and ultrasonic attenuation in metals at low temperatures.

SCIENCE BEGINS AT HOME—Anne Roe—*Thomas Alva Edison Foundation*, 20 p., paper, single copies free upon request direct to publisher, 8 W. 40th St., New York 18, N.Y. Psychologist looks into the social and family influences that go into the making of the scientific personality. Bibliography.

SCIENCE SINCE 1500: A Short History of Mathematics, Physics, Chemistry, Biology—H. T. Pledge—*Harper*, 357 p., illus., paper, \$1.85. Reprint of book first published in 1939.

SOAP BUBBLES AND THE FORCES WHICH MOULD THEM—C. V. Boys—*Doubleday*, 156 p., illus., paper, 95¢. A long-out-of-print classic, still an excellent treatment of the science of soap bubbles, written for the layman.

TEXTBOOK OF ANATOMY AND PHYSIOLOGY—Catherine Parker Anthony—*Mosby*, 5th ed., 574 p., illus., \$5.35. Fully revised edition contains new chapters on fluid and electrolyte balance and on acid-base balance.

THE TRAVELING ELEMENTARY SCHOOL SCIENCE LIBRARY—Hilary J. Deason, ass't by Nancy C. Barrett and Stephen W. Fisher—*Am. Assn. for the Advancement of Science*, 47 p., paper, 25¢. List of 160 books in the major scientific disciplines, selected for students from first to sixth or eighth grades, marked primary, intermediate or advanced.

THE TRAVELING HIGH SCHOOL SCIENCE LIBRARY—Hilary J. Deason—*Am. Assn. for the Advancement of Science*, 5th ed., 61 p., paper, 25¢. 200 titles chosen primarily for the academically talented students in high school who have the interest and initiative to go beyond routine textbook assignments. In 1959-60 about 1,700 senior high schools will participate in this circulating library program.

THE TRUE BOOK OF JUNGLES—Illa Podendorf—*Childrens Press*, 47 p., illus. by Katherine Grace, \$2. Acquaints the youngest readers with the plants and animal life of the jungle.

UNDERWATER WORK: A Manual of Scuba Commercial, Salvage and Construction Operations—John E. Cayford—*Cornell Maritime*, 217 p., illus., \$5. About underwater construction and repairs, pipelaying, welding, blasting, logging and photography.

Science News Letter, September 12, 1959

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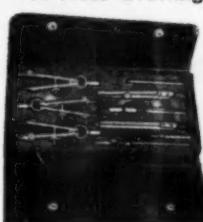
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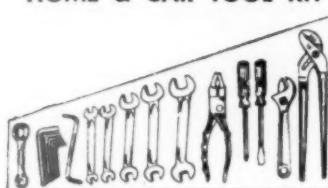
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Questions

ASTRONAUTICS — Why do scientists think "Lunik" was aimed to hit the moon? p. 167.

BOTANY — What is vernalization and can plants do without it? p. 165.

MEDICINE — To what order do bees, wasps, hornets, yellow jackets and ants belong? p. 164.

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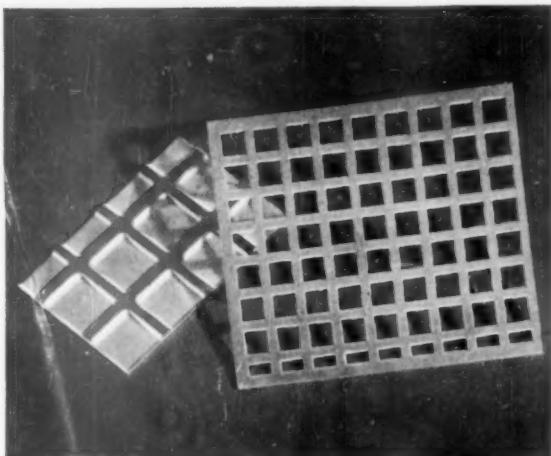
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Acido orotico

Around the turn of the century it was brought to the world's attention that the inhabitants of certain Bulgarian villages were a) living to ripe old ages and b) consuming vast quantities of the ripe old fermentation products of the local dairyery. Echoes of this coincidence have rumbled forth at intervals since.

In the twenties a certain elderly biochemist who had seen much importance in the correlation was a celebrated figure of Paris. In the thirties American milk wagons were bedizened with signs advertising a certain brand of fermented milk. In the forties the word "yogurt" entered the vocabulary of the American intelligentsia. With the dawn of the fifties, the *Journal of the American Chemical Society* (72, 2312) reported that certain strains of *Lactobacillus bulgaricus* thrived when supplied with 6-carboxyuracil, a substance first synthesized in 1897 for academic exercise and later shown to be identical with orotic acid.

This name was derived from *oρόπος*, whey, by two Italians who had encountered the substance while making lactose from milk whey liquors.

The flowering of biochemical sophistication in the mid-fifties has excited a deeper curiosity about orotic acid. To some it looks like a significant intermediate in the process by which living organisms fabricate nucleotides for their DNA—the stuff of genes—out of the amino acids at their disposal. This is big talk.

In Italy interest in *acido orotico* has been rekindled to a small-scale frenzy. At the University of Urbino last June a colloquium on pyrimidines (*Acta Vitaminologica*, 12, 195-328) devoted much of its attention to the compound. One man claimed his evidence showed that a dietary deficiency of orotic acid affects pregnancy, lactation, and growth in the rat, that it is a vitamin-like factor essential for the survival of the newborn. One senses the closing of a circle.

If we had not been invited to quote on 100 kilos of Orotic Acid recently, we might not have looked up all this lore. We didn't get the order, but in trying we made enough of it to stock as *Eastman 7784* (along with 2-Thioorotic Acid, *Eastman 7783*) for the convenience of biochemical investigators. Anybody who wants to sell it from milk trucks is strictly on his own.

We have some 3700 Eastman Organic Chemicals to worry about. Catalog on request from Distillation Products Industries, Rochester 3, N. Y. (Division of *Eastman Kodak Company*).

Prices are list and subject to change without notice.

Kodak
TRADE MARK

• New Machines and Gadgets •

For sources of more information on new things described, send a self-addressed stamped envelope to SCIENCE NEWS LETTER, 1719 N St., N.W., Washington 6, D.C., and ask for Gadget Bulletin 1004. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

AUTO SPOTLIGHT plugs into cigarette lighter socket to use as a trunk light or to aid in changing tires or making motor repairs at night. The spotlight, which has both a handle and a hanging hook, is said to consume a minimum amount of current. Models are available for six- or 12-volt systems.

Science News Letter, September 12, 1959

WEATHER GLASS in the spirit of Old Nantucket serves as a decoration and a practical barometer. When the glass section is filled with clear or colored water the atmospheric pressure is indicated by the water level's rise and fall. It is 10½ inches in height.

Science News Letter, September 12, 1959

CAULKING COMPOUND made of polyethylene comes in a variety of bright colors and is applicable either by knife or gun. It is weatherproof and can be applied directly from the can without mixing. The compound does not become brittle with age and can be used on many different materials.

Science News Letter, September 12, 1959

INDOOR-OUTDOOR FURNITURE made of rust-resistant steel wire, shown in photograph, has removable urethane foam cushions. The mildew- and fungus-resistant



cushions are covered with weather-proof vinyl upholstery. Lounge chairs, side chairs, chaises and tables are available.

Science News Letter, September 12, 1959

PLASTIC RAFT made of glass fiber and expandable polystyrene is 80 inches in diameter and will support 1,600 pounds. The durable 80-pound raft is round and has a slightly concave deck that allows water to drain towards an opening in the center and

helps passengers to stay aboard. A plastic rope rail is looped around the outside near the deck, and an aluminum ladder is attached to the raft.

Science News Letter, September 12, 1959

SPARK PLUG AND CABLE TESTER can locate high tension ignition losses that sap power from the auto engine. The shock-proof, pocket-sized tester can also test spark plugs and find cracked or faulty insulation in ignition coil and distributor cap.

Science News Letter, September 12, 1959

GLASS COASTERS made of polystyrene are moisture-proof and do not leave rings or scratches on the table surface. The all-in-one coaster and cooler with thermos qualities is lightweight and reportedly retains ice for three hours. They are available in two sizes.

Science News Letter, September 12, 1959

INSECTICIDE DISPENSER releases measured amounts of pressurized insecticide every 15 minutes and thus provides around-the-clock protection for an enclosed area. The 5½-pound unit, not much larger than a cigar box, operates on standard A.C. current and can be mounted on a wall in homes, restaurants, hospitals, factories or barns. It protects a 6,000-cubic-foot area.

Science News Letter, September 12, 1959

Nature Ramblings

By HORACE LOFTIN

THE LINE FLOWED easily from the reel, dropping the artificial bait on the water near a sodden bush. A jerk of the rod made the bait flop on the surface like a wounded minnow. This movement caught the watchful eye of the pike lurking near the bank. In an instantaneous rush the large fish struck the bait, encircling it in his well-toothed jaws and clamping down—to meet the trebled hooks.

This is often the way of the predacious fish, the hunters.

They depend upon speed and a firm, ferocious bite to catch their prey. This is also one of the reasons they are sought after as game fish. The thrill of that quick strike and the ensuing rush is what the sportsman loves above all.

But this is only one of the many ways in which fish secure a meal. Recently, a handful of goodsized minnows were placed in an aquarium with a hungry bowfin (or mudfish) about 12 inches long. The min-

Table Manners



nows quickly spread throughout the aquarium, some swimming enticingly close to the bowfin, but he showed no sign of excitement at the prospect of a meal. But then it was noticed that the minnows became fewer and fewer as the minutes passed. What had happened to them?

This mystery was resolved when it was seen that the bowfin casually sidled up to one large minnow, keeping about one-half inch from it. Then, without the slightest movement on the part of the bowfin, that minnow simply disappeared down the big

fish's throat. The bowfin had sucked the minnow into its mouth.

Another type of fish feeding can be seen in the large salt water sheepshead. The sheepshead's diet consists largely of bits of oysters, crabs and other hard-shelled delicacies to be found on and around old pilings. These fish crushes with his powerful teeth. The time-honored bait for sheepsheads consists of fiddler crabs or barnacles attached to a very sharp and long shanked hook.

As can be seen in clear water, the sheepshead will approach the bait with utmost caution, seeming to examine it from all angles. Then comes the taste test. He very gently takes the bait in its mouth and crushes it a bit. Fishermen say he is "sucking" the bait. It is at this moment—old-timers can tell by the "feel" of the bite—that the line is jerked to set the hook in the sheepshead's bony mouth. Otherwise, that old sheepshead will have his meal, leaving an empty and crushed crab or barnacle shell.

Science News Letter, September 12, 1959

